

Appl. No.: 10/715,809
Amendment Dated June 15, 2006
Reply to Office Action of March 6, 2006

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Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application

Listing of Claims:

1. (Cancelled)
2. (Currently Amended) A wire bonding machine according to claim ~~1-10~~ further comprising a second wire bonding head mounted above the positioning system.
3. - 6. (Cancelled)
7. (Currently Amended) A wire bonding machine according to claim ~~4-10~~ wherein the substantially horizontal x-axis direction is substantially orthogonal to the substantially horizontal y-axis direction.
8. (Currently Amended) A wire bonding machine according to claim ~~4-10~~ wherein the fixture supporting the at least one semiconductor device is ~~positioned in a~~ magazine which supports with at least one other semiconductor device.
9. (Currently Amended) A wire bonding machine according to claim 8 further comprising a magazine handler for feeding the magazine to the ~~conveyance-positioning~~ system.
10. (Currently Amended) A wire bonding machine for bonding a wire to a semiconductor device, the wire bonding machine comprising:

a fixture supporting at least one semiconductor device to be wire bonded in a substantially horizontal plane;

a wire bonding head supporting a bonding tool, the wire bonding head being rotatably mounted to a portion of the wire bonding machine to permit rotation of the bonding tool about a substantially vertical axis, the bonding tool being rotatable about a substantially horizontal axis alone or in combination with the wire bonding head, the wire bonding head being configured to provide motion of the bonding tool along only one of (a) a substantially horizontal x-axis direction and (b) a substantially horizontal y-axis direction; and

a positioning system for positioning the fixture in a substantially horizontal direction;

and

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a camera for receiving an image of at least one of the fixture or the at least one semiconductor device, the camera being supported by the bonding head.

11. (Cancelled)

12. (Previously Presented) The wire bonding machine according to claim 10 wherein the bonding head has a longitudinal axis and the positioning system translates the fixture in a direction at an acute angle with respect to the longitudinal axis of the bonding head.

13. (Currently Amended) The wire bonding machine according to claim 10 wherein the bonding tool is rotatable about the substantially horizontal axis for movement of the bonding tool in a vertical direction.

14. (Currently Amended) The wire bonding machine according to claim 13 wherein at least a portion of the wire bonding head is rotatable about the substantially horizontal axis and the bonding tool is secured to the portion of the wire bonding head to rotate about the substantially horizontal axis.

15. (Previously Presented) The wire bonding machine according to claim 10 further comprising a motor drive assembly engaged with the wire bonding head on an opposite side of the vertical axis from the bonding tool.

16. (Previously Presented) A wire bonding machine for bonding a wire to a semiconductor device, the wire bonding machine comprising:

a fixture supporting at least one semiconductor device to be wire bonded in a substantially horizontal plane;

a wire bonding head supporting a bonding tool, the wire bonding head being rotatably mounted to a portion of the wire bonding machine to permit rotation of the bonding tool about a vertical axis; and

a motor drive assembly engaged with the wire bonding head on an opposite side of the vertical axis from the bonding tool, the bonding head having a mass that is substantially balanced on opposite sides of the vertical axis.

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17. (Previously Presented) The wire bonding machine according to claim 10 further comprising a second wire bonding head including a second bonding tool supported thereby, the second wire bonding head rotatably mounted to a portion of the wire bonding machine to permit rotation of the second bonding tool about a second vertical axis.

18. - 19. (Cancelled)

20. (Currently Amended) The wire bonding machine according to claim 18 wherein the camera is mounted to a camera conveyance system which carries the camera in a substantially horizontal direction.

21. (Cancelled)

22. (New) A method of operating a wire bonding system, the wire bonding system being configured to bond a wire to a workpiece, the method comprising the steps of:

(1) positioning a workpiece supported by a work table by moving the work table prior to performing a high speed wire bonding operation on the workpiece;

(2) moving a bond head of the wire bonding system in a first substantially horizontal direction during the high speed wire bonding operation, the bond head supporting a bonding tool; and

(3) moving the workpiece in a second substantially horizontal direction during the high speed wire bonding operation by moving the work table, thereby providing high speed translation of the workpiece in the second substantially horizontal direction.

23. (New) The method of claim 22 further comprising the step of: (4) pivoting the bonding tool about a substantially horizontal axis to provide a vertical range of motion for the bonding tool.

24. (New) The method of claim 22 wherein step (2) comprises rotating the bond head about a vertical axis to provide motion in the first substantially horizontal direction.

25. (New) The method of claim 22 wherein step (2) comprises moving the the bond head in the first substantially horizontal direction, the first substantially horizontal direction being a Y-axis direction.

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26. (New) The method of claim 22 wherein step (3) comprises moving the workpiece in the second substantially horizontal direction, the second substantially horizontal direction being an X-axis direction.

27. (New) The method of claim 22 further comprising the step of: moving a second bond head supporting a second bonding tool in the first substantially horizontal direction during the wire bonding operation.

28. (New) The method of claim 22 wherein step (3) comprises moving the workpiece in the second substantially horizontal direction such that the motion in the second substantially horizontal direction is orthogonal to motion in the first substantially horizontal direction.

29. (New) The method of claim 22 wherein step (3) comprises moving a plurality of workpieces, in a magazine, in the second substantially horizontal direction.

30. (New) The method of claim 22 wherein step (3) comprises moving the workpiece in the second substantially horizontal direction such that the second substantially horizontal direction is substantially parallel to a longitudinal axis of the bond head.

31. (New) The method of claim 22 wherein step (3) comprises moving the workpiece in the second substantially horizontal direction such that the second substantially horizontal direction is at an acute angle with respect to a longitudinal axis of the bond head.

32. (New) The method of claim 22 further comprising receiving an image of at least one of the workpiece and a fixture supporting the workpiece using a camera.

33. (New) The method of claim 32 further comprising moving the camera along a substantially horizontal axis.